

EFFECTIVENESS OF STATE ALCOHOL TAX POLICY

PPD 631 FINAL PROJECT

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Introduction

Alcohol consumption is associated with costs to society from anti-social behavior, crime, and public costs of policing and health care (Griffith, Connell, and Smith, 2019). Governments attempt to reduce problematic alcohol consumption through limiting availability and with policies that aim to increase prices (Chaloupka, Grossman, and Saffer, 1998). Taxation is recognized as an effective policy intervention. Governments impose excise taxes on alcoholic beverages including spirits, beer, and wine. An excise tax is generally on the quantity of alcoholic beverages purchased while a sales tax is based on the price of a good purchased. Producers, importers, wholesalers, and, sometimes, retailers pay excise alcohol taxes. Eventually, these alcohol taxes will be passed on to consumers through higher prices. Research illustrates that consumers are relatively sensitive to changes in alcoholic beverage prices. Raising alcohol prices would potentially reduce alcohol consumption (Wagenaar, 2009). Moreover, alcohol taxes are considered to be a tool to compensate for alcohol-related negative externalities (Griffith, Connell, and Smith, 2019). The purpose of this project is to compare and assess the social influence of state alcohol taxes as a tool of alcohol control by using different indicators including the consumption of alcoholic beverages, the level of excessive alcohol use, costs of excessive alcohol consumption, and liver cancer incidence rates.

Approach & Data Selection

To analyze the effect, GIS is the ideal tool to present, compare, and explain data. To unravel this problem, it is more intuitive and easy-to-understand to use geographic analysis and data projection. During the data collection process, first and foremost, to create a composite map

image, I collected data on 2018 and 2016 state distilled spirits excise tax rates from the Distilled Spirits Council of the United States. Next, I gathered the data relating to alcohol consumption in different states to examine the effect of alcohol tax on the consumption of alcoholic beverages. The consumption data are available at the National Institute on Alcohol Abuse and Alcoholism (NIAAA). Instead of looking at the total alcohol consumption per state, I used the consumption per capita in gallons. Thirdly, I obtained the data relating to excessive alcohol use in the form of binge drinking, which are available at the Centers for Disease Control and Prevention (CDC). The purpose is to find out if state alcohol control is somewhat alleviating the level of excessive drinking. Aside from this, I also collected the data on excessive alcohol consumption costs per capita. The source is also from CDC. Lastly, I looked into the liver cancer incidence rate in each state to identify whether there is an association between reduced risk of health problems and increased rate of alcohol taxes as a tool of alcohol control. Liver cancer incidence rates by states can be found at NIAAA. All comparisons analyzed among these indicators used data from 2016 or 2018.

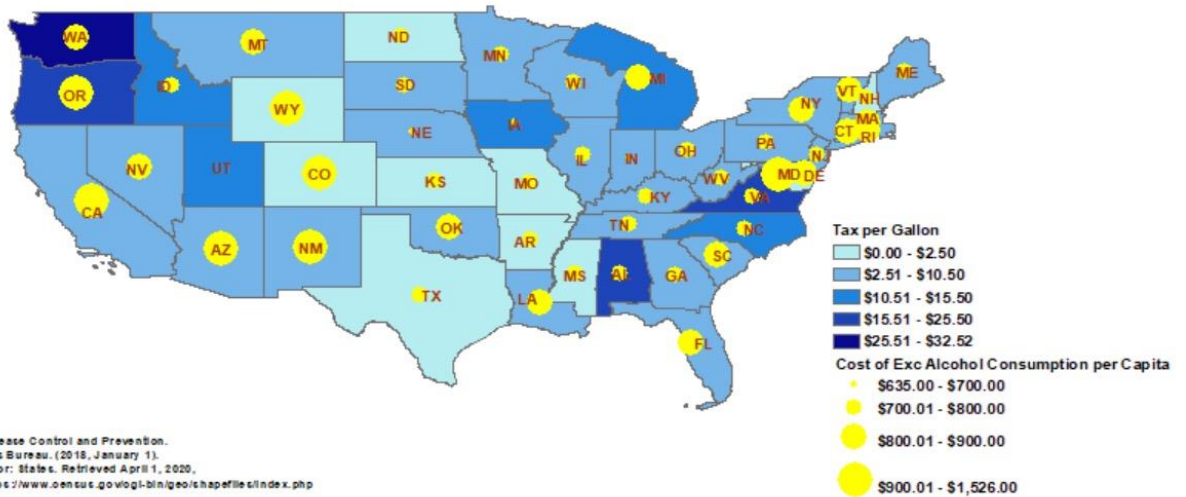
Discussion & Analysis

To assess the effectiveness of alcohol tax policy, I would analyze the impact of alcohol tax by comparing different tax rates at the state level with different indicators. Alcohol taxes at the federal, state, and local levels add greatly to the retail price of alcoholic beverages, especially for distilled spirits (Alcohol Problems and Solutions, 2018). Generally, excise alcohol taxes on spirits are much higher than those on beer or wine. Approximately half of that tax money comes from spirits consumers (Alcohol Problems and Solutions, 2018). Therefore, the impacts of

lower spirits excise taxes (lake background color, tax rate lower than \$10.5 per gallon) tended to have a higher prevalence of binge drinking (larger yellow circle symbol size, percentage larger than 15.8%).

The state with the lowest binge drinking level was Alabama. Alabama levied spirits tax rate at \$12.80 per gallon, which falls in the high-tax group (darker blue background color). Notwithstanding, in 2018, spirits were taxed the highest in Washington at \$32.52 per gallon while over 16% of adults in Washington still had excessive alcohol use. Coincidentally, Oregon had the second-highest spirits tax rate, which was around \$22.75 per gallon but it still reported a high percentage of binge drinking among adults in 2018. Therefore, it is relatively difficult to ascertain a relationship between levels of taxation and extent of excessive drinking.

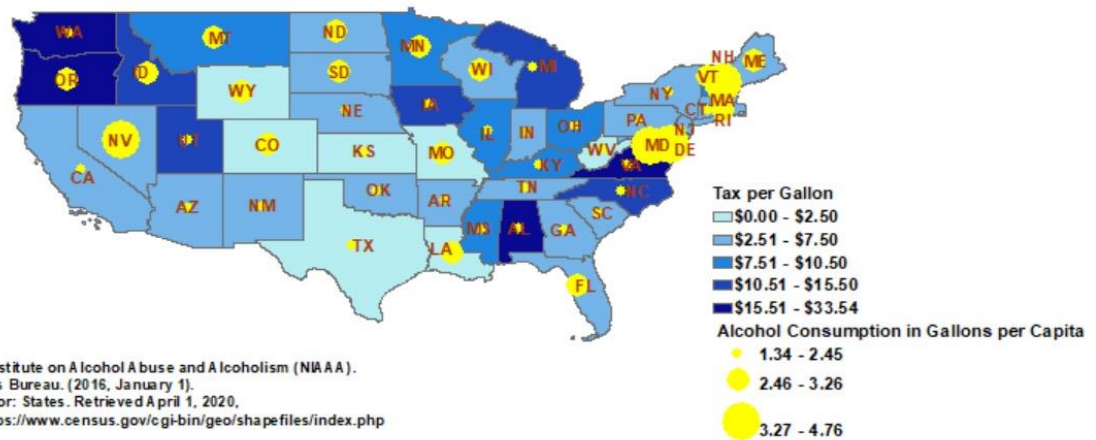
State Distilled Spirits Excise Tax Rates and Cost of Excessive Alcohol Consumption per Capita, 2018



Costs of excessive drinking are primarily attributed to losses in workplace productivity, health care expenses, and other costs related to a combination of criminal justice expenses, motor vehicle crash costs, and property damage (CDC, 2018). Notably, binge drinking is responsible for approximately 75% of the cost of excessive alcohol consumption in all states (CDC,2018).

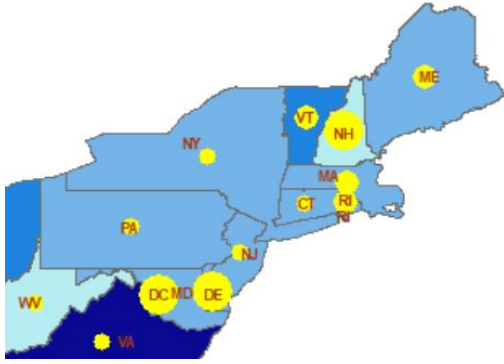
As mentioned before, in some states which had heavier spirits excise taxes such as Alabama and Utah, the prevalence of binge drinking was lower. In 2018, excessive alcohol consumption cost Utah about \$635 per capita, which was the lowest among all states. In Alabama, binge drinking cost \$779 per capita, which also falls in the low-cost group, ranging from \$635 to \$800. Looking at states imposing alcohol taxes less than \$10.5 per gallon such as Colorado, Wyoming, New Mexico, Arizona, and California, they had a higher burden of excessive alcohol use costs. However, in some states, a higher proportion of binge drinking among adults did not correspond with heavier alcohol consumption costs.

State Distilled Spirits Excise Tax Rates and Alcohol Consumption per Capita, 2016



Data Source: The National Institute on Alcohol Abuse and Alcoholism (NIAAA).
Shapefile Source: US Census Bureau. (2016, January 1).
2016TIGER/Line Shapefiles for: States. Retrieved April 1, 2020,
from US Census Bureau: <https://www.census.gov/cgi-bin/geo/shapefiles/index.php>

Next, I will look into the effect of alcohol tax on the consumption of alcoholic beverages. According to NIAAA (2005), there is a consensus among researchers that higher alcoholic beverage taxes lead to less amount of drinking. The map above reveals the relationship between distilled spirits excise tax rates and alcohol consumption.



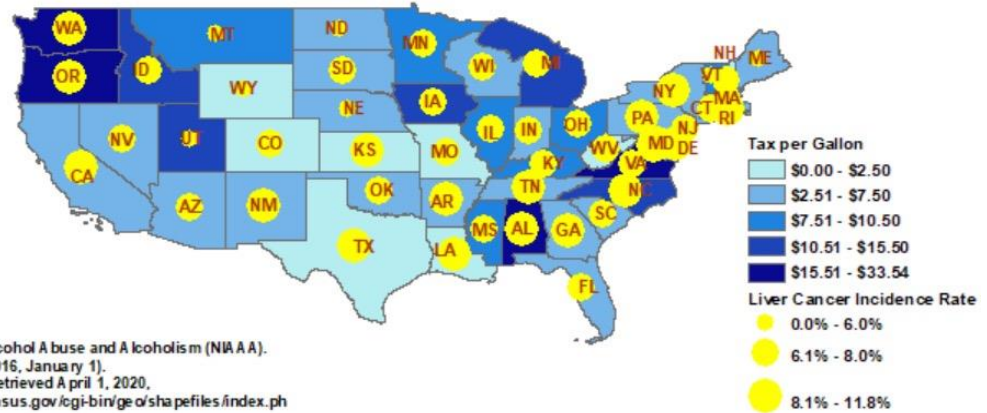
Firstly, New Hampshire does not collect excise taxes on the purchase of liquor (Greenblatt, 2018). As a result, the tax-free liquor promotes alcohol consumptions and the consumption number is also inflated by customers from nearby East Coast

states. In 2016, New Hampshire was the one that had the highest rate of alcohol consumption, which was 4.76 gallons per capita.

Moreover, Nevada had the fourth-highest rate of consumption and it only imposed spirits excise tax at \$3.6 per gallon in 2016. Las Vegas is one of the country's leading vacation destinations. It draws masses of visitors every year whilst suffering heavy tourist alcohol consumption (McNamee, 2016). Aside from this, the other three states that have no sales tax – Delaware, Montana, and Oregon – were also having more alcohol consumptions.

Conversely, with a rate of consumption that was three times lower than New Hampshire, Utah levied a relatively higher tax rate at \$12.75 per gallon. In fact, apart from the tax effect, the deep political influence of Utah's Mormon religious group also has resulted in its restrictive alcohol control, causing lower alcohol consumption (Kovner, 2018). In 2016, spirits were taxed the highest in Washington at \$33.54 per gallon and it only had an alcohol consumption rate of 2.26 gallons per capita. It seems that when tax increases, the consumption of alcoholic beverages falls. However, there are still several outliers that are noteworthy. For instance, although Oregon imposed the second-highest spirits excise taxes, alcohol taxes did not have a great effect on reducing alcohol consumption. In California, it appears that a low alcohol tax rate did not drive deeper alcohol consumption.

State Distilled Spirits Excise Tax Rates and Liver Cancer Incidence Rate, 2016



While alcohol plays an important social role in many cultures, excessive alcohol consumption is associated with an increased risk of several health problems such as liver disease, heart disease, and cancer of the mouth, throat, esophagus, and liver (World Population Review, 2020). The map above displays the distribution of state alcohol tax rates and liver cancer incidence rates. In 2016, with a tax rate of only \$2.8 per gallon, Texas had the highest liver cancer incidence rates, which was about 11.8%. On the contrary, Vermont had the lowest liver cancer incidence rate of 5.1%. But its tax rate was \$7.71 per gallon, which was not quite high among all states. Furthermore, when looking at states with high alcohol tax rates (darker blue background color) such as Washington, Oregon, Alabama, and North Carolina, it appears to be no positive relationship between increase in alcohol taxes and reduction in liver cancer risks.

Limitation

To have an in-depth understanding of my research topic and identify the impact of potential analysis weakness, some limitations should be noted. Firstly, I observed some relationships between alcohol tax rates and some of the indicators I chose such as alcohol consumption. Notwithstanding, it does not denote that these effects are solely attributed to the change in alcohol tax rates. For instance, apart from alcohol tax rates, regional differences in drinking culture can also affect state-by-state alcohol consumption (Kovner, 2018). As mentioned before, in Utah, which had the lowest rate of alcohol consumption per capita in 2016, the profound political influence of its large Mormon population has led to the most restrictive alcohol purchasing laws in the country (Kovner, 2018). Furthermore, alcohol consumption is also associated with people's income level (French and Zarkin, 1995). Therefore, I cannot guarantee these comparisons are equal in all respects except for only one independent variable which is the change in alcohol tax rates. There must be some result biases.

Secondly, although alcohol abuse can increase the risk of getting liver diseases, not all liver diseases are alcohol-related. For example, Obesity or diabetes can also potentially lead to liver diseases. Therefore, we cannot directly attribute them to alcohol abuse. If I have unlimited access to data and resources, my primary interest is alcohol-related healthy problem rates in each state, which can deliver more accurate, relevant, and reliable results. Furthermore, I would also look into data on state-by-state alcohol consumption among college students or high-risk college drinking. The purpose is to ascertain if raising excise taxes on alcoholic beverages can help curb student drinking and if college students respond as much to alcohol tax changes as other adults do.

Another limitation of the project is the time span. My analysis was based on one-year data. Since I examined data only in one specific year (2016 or 2018), the correlations in the long-term cannot be revealed sufficiently. For instance, liver cancer is an evolving disease. Emergence and evolution of liver diseases usually take several years. To improve the reliability of my analysis, it would be better to examine the linkages through which an alcohol tax increase year-by-year might alleviate drinking-related problems year-by-year.

Conclusion

Public policies can affect alcoholic beverage prices in several ways (Chaloupka, Grossman, and Saffer, 1998). Raising taxes on alcohol is one of the most cost-effective methods to reduce the demand for alcohol, regulate harmful alcohol use and, by extension, improve overall health in the population other than just acting as a budget-balancing measure (Candon, 2018).

Before diving into the data analysis, the conclusion I expected was alcohol taxes do have some positive impacts on reducing casual drinkers' consumption, excessive alcohol use, and even liver cancer incidences. However, the precise magnitude of the effects of alcohol tax changes on these indicators has been somewhat harder to determine. Firstly, it seems that when tax increases, the consumption of alcoholic beverages among adults falls. But alcohol tax is just one of the factors that affect alcohol consumption. Secondly, there was a large amount of excessive alcohol consumption at all levels of taxation. No relationship appears to exist between excessive drinking amount and alcohol tax levels. Furthermore, there is not much consistency in alcohol tax increase and alcohol consumption cost reduction. Lastly, one unexpected result is

that the increased rate of alcohol taxes is not positively associated with reduced risk of liver cancer incidences. Moving forward, it would be desirable to use more technical data analysis to back up the conclusion such as regression analysis.

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